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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,495	10/24/2003	Abhijeet Gole	5693P029	1876

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EXAMINER
VO, THANH DUC

ART UNIT	PAPER NUMBER
2189	

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
	10/692,495	GOLE ET AL.
Office Action Summary	Examiner	Art Unit	
	Thanh D. Vo	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 June 2006</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6-10,12,14-17,19 and 20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,6-10,12,14-17,19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>17 January 2006</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This Office Action is responsive to the RCE filed on June 5, 2006. Claim 18 has

been canceled. Claims 1, 3, 4, 6, 10, and 17 have been amended. Claims 1, 3, 4, 6-

10, 12, 14-17, 19, and 20 are presented for examination. Claims 1, 3, 4, 6-10, 12, 14-

17, 19, and 20 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of
> making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the
> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall
> set forth the best mode contemplated by the inventor of carrying out his invention.

2.   Claims 1, 3, 4, 6-10, 12, and 14-16 are rejected under 35 U.S.C. 112, first

paragraph, as failing to comply with the written description requirement. The claim(s)

contains subject matter which was not described in the specification in such a way as to

reasonably convey to one skilled in the relevant art that the inventor(s), at the time the

application was filed, had possession of the claimed invention.

Claim 1 is failing to comply with the written description requirement because of

the following limitation:

"when the first portion of the non-volatile storage device in the first storage is full,

causing the second storage server to transfer the data access request from the memory

on the second storage server to a data container corresponding to the first storage

server on the second storage server".

Although the specification of the present invention discloses:

a) a non-volatile storage device in the first storage

b) transferring the data access request from the memory on the second storage

server to a data container corresponding to the first storage server on the second

storage server

However, the specification of the present invention fails to disclose the condition

of: when the first portion of the **non-volatile storage device in the first storage is full**

then causing the step (b) above to execute. The specification rather teaches the

condition **if the non-volatile storage device on the destination filer (second storage**

server) is full then writing the data access request from a memory on the destination

filer (second storage server) to a disk. See Fig. 8 and corresponding description on

paragraphs 0049-0050.

3.   Claim 10 is failing to comply with the same written description requirement as

discussed in claim 1. Therefore, claim 10 is rejected under the same rationale as claim

1.

All dependent claims are rejected as having the same deficiencies as the claims

they depend from.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set
forth in section 102 of this title, if the differences between the subject matter sought to be patented and
the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 1, 3, 4, 6-10, 12, 14-16 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Yanai et al. (US Patent 6,502,205) in view of Courts et al. (US Patent

5,636,360)

As per claims 1 and 10, Yanai et al. discloses a method for mirroring data

comprising:

receiving at a first storage server a data access request from a client coupled to

the first storage server (See col. 2, line 60 - col. 3, line 9);

writing the data access request to a first portion of a non-volatile storage device

in the first storage server (col. 32, lines 55-56);

transmitting the data access request from the first storage server to a second

storage server to be written to a memory on the second storage server (See col. 10,

lines 51-55);

Yanai et al. further teaches cache 28 (Fig. 1) on the primary storage system and

cache 65 (Fig. 1) on secondary storage system to temporary storing the data access

request. See col. 7, line 67 – col. 8, line 2.

Yanai et al. did not explicitly disclose when the first portion of the non-volatile

storage device in the first storage server is full, causing the second storage server to

transfer the data access request from the memory on the second storage server to a

data container corresponding to the first storage server on the second storage server.

Courts et al. teaches a method of copying the contents of a log buffer to a log

partition when the log buffer is full (col. 2, lines 35-37).

It would have been obvious to one having an ordinary skill in the art at the time of

the Applicant's invention to realize that the cache or log buffer in the primary storage

system and the secondary storage system are carrying a ripple effect. Such ripple

effect in the storage system is that once the cache/buffer in the primary storage system

is full, the data then transferred to another storage device within the primary storage

system. The data in the primary storage device and the secondary storage device has

to be mirrored with each other therefore the data has to be transferred to the secondary

storage system as being taught above. Once the cache/buffer in the secondary storage

system is full during the period of receiving the data access request from the primary

storage system, the cache/buffer has to transfer the data to another storage device

within the secondary storage system.

Therefore, with the ripple effect relationship set forth, it would have been obvious

to one having an ordinary skill in the art at the time of the Applicant's invention to modify

the system of Yanai et al. to implement the method taught by Courts et al. in order to

arrive at the current invention in order to enhance the operation speed of the file system

while ensuring the consistency and data integrity of the file system as taught by Court et

al. on col. 2, lines 41-45.

As per claim 3, Yanai et al. discloses a method wherein causing the second

storage server to transfer the data access request from the memory to the data

container comprises:

sending a synchronization request at the second storage server from the first

storage server. See col. 10, lines 19-23

As per claim 4, Yanai et al. discloses a method comprising:

sending an acknowledgement from the second storage server to the first storage

server in response to receiving the data access request (col. 10, lines 19-24) to cause

the first storage server to send a response to the client (col. 32, lines 26-27) after the

data access request has been stored on the first storage server and stored in the

memory on the second storage server. See col. 32, lines 49-57 and col. 2, lines 60-67.

As per claim 6, Yanai et al. discloses a method comprising:

writing the data access request to a first portion of the memory on the first

second storage server, the first portion of the memory on the second storage server

being associated with the first portion of the non-volatile storage device in the first

storage server. *See col. 15, lines 7-14, wherein the R1 and R2 of the primary storage*

system are synchronized and forming a pair with the R1 and R2 of the secondary

storage device. Therefore, the data within R1 of the primary storage device is duplicate

of the data in R1 of the secondary storage device and they are associating with each

other.

As per claim 7, Yanai et al. discloses a method wherein the data access request

is transmitted from the first storage server to the second storage server over a network.

(Fig. 12, items 240-241 and col. 12, lines 40-42)

As per claim 8, Yanai et al. discloses a method comprising:

assigning a sequence number to the data access request, wherein the sequence

number designates a position of the data access request in a group of data access

requests to ensure that the data access request is properly ordered within the data

container. See col. 18 lines 45-54.

As per claim 9, Yanai et al. discloses a method wherein the data container 294

must contain a file. See Fig. 12, item 294.

As per claim 12, Yanai et al. discloses an apparatus wherein the network

comprises a Transmission Control Protocol/Internet Protocol (TCP/IP) network. See col.

13, lines 7-13, wherein the TCP/IP is an inherent feature of the ESCON system.

As per claim 14, Yanai et al. discloses an apparatus wherein the memory

comprises a nonvolatile random access memory (NVRAM). See col. 18, lines 5-9,

wherein random access memory is backed-up by a battery power which makes the

RAM becomes a nonvolatile random access memory.

As per claim 15, Yanai et al. discloses an apparatus wherein the destination

storage server modifies an image of a volume maintained by the source storage server

on a second nonvolatile mass storage device (secondary volumes) coupled to the

destination storage server according to the access request (col. 10, lines 50-58) when the source storage server makes a synchronization request (col. 10, lines 19-23).

As per claim 16, Yanai et al. discloses an apparatus wherein the data container is a file. See Fig. 12, item 294, wherein R2 comprises of data file.

5.   Claims 17, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanai et al. (6,502,205) in view of McMillian, Jr. and Achiwa et a. (US 20040153719).

As per claim 17, Yanai et al. discloses a method comprising:

receiving a data access request at a destination filer from source filer (col. 2, lines 54-59), wherein the data access request is written to a first memory coupled to the source filer (col. 32, lines 55-56);

sending an acknowledgement to the source filer in response to the destination filer receiving the data access request (col. 10, lines 19-24);

writing the data access request to a second memory (Fig. 12, item 293) coupled to the destination filer (col. 32, lines 49-57);

transferring the data access request from the second memory 293 to a file corresponding to a source filer on a volume coupled to the destination filer (col. 32, lines 37-38; lines 49-53);

receiving a second data access request from a second source filer (col. 2, lines 54-59), wherein the second data access request is written to a third memory coupled to the second source filer (col. 32, lines 55-56);

sending a second acknowledgement to the second source filer in response to the destination filer receiving the second data access request (col. 10, lines 19-24);

writing the second data access request to the second memory (Fig. 12, item 293, col. 32, lines 49-57);

transferring the second data access request to a second file corresponding to the second source filer on the volume coupled to the destination filer (col. 32, lines 37-38; lines 49-53);

Yanai et al. did not explicitly disclose a method of removing the data access request from the second memory after transferring the data access request to the volume. However, McMillan disclosed a method of removing a request when an acknowledgement is transferred from one location to another (col. 5, lines 35-39). At the time of the Applicant's invention it would have been obvious to one having an ordinary skill in the art to recognize that it is advantageous to remove/delete the access request once the transaction is completed or the data has been transferred. The motivation of doing so is to prevent unnecessary data from transferring to the volume again and maintaining an appropriate operation of the system while increasing data throughput.

Although Yanai et al. did not explicitly disclose a second source filer coupled to the destination filer which performing the duplicate tasks as of the first source filer.

However, Achiwa et al. discloses a system wherein there are multiple storage servers interconnected with each other in order to replicate the copy of data stored in the storage device. See Fig. 1 and page 1, paragraph 0009, lines 1-12.

It would have been obvious to one having an ordinary skill in the art at the time of the Applicant's invention to combine the system of Achiwa et al. with the system of Yanai et al. in order to arrive at the current invention. The motivation of doing so is provide a data storage system with a backup source filer in case one of the source filer failed as taught by Achiwa et al. on page 1, paragraph 0006, lines 4-7.

As per claim 19, Yanai et al. did not explicitly disclose a method of connecting a second source filer to the client in response to a system failure.

However, Achiwa et al. discloses a method further comprising connecting the second source filer to the client in response to a system failure. See page 1, paragraph 0006, lines 4-7.

It would have been obvious to one having an ordinary skill in the art at the time of the Applicant's invention to connect the source filer to the client in response to the system failure. The motivation of doing so is to provide a stable storage system since there are additional sources to take over the operation process if one of the other sources failed.

As per claim 20, Yanai et al. disclosed a method comprising:

applying the access request to an image of a volume maintained by the source filer and allowing the client to access the image. See col. 17, lines 25-40.
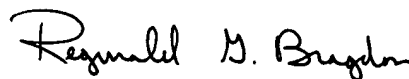
Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Thanh D. Vo whose telephone number is (571) 272-

0708. The examiner can normally be reached on M-F 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Reginald G. Bragdon can be reached on (571) 272-4204. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

Information regarding the status of an application may be obtained from the

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Thanh D. Vo
Patent Examiner
AU 2189
6/26/2006